Social, Emotional, & Educational Consequences of Undetected Children's Vision Problems

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Abstract

This paper was designed for educators and related professionals who are concerned about learning problems in school-aged children, along with the consequences of these problems. The link between undetected vision problems, social and emotion problems, juvenile delinquency and illiteracy is reviewed. A multidisciplinary approach to deal with these problems is strongly advocated. On the basis of prior research, the author recommends that every child have a comprehensive vision examination prior to entering kindergarten, and additional vision evaluations and specific vision screenings through grade twelve.

Key Words

illiteracy, juvenile delinquency, multidisciplinary approach, social-emotional problems, vision, vision screening

In addressing the social, emotional, and educational consequences of undetected vision problems in children, the most important factor to consider is that there is no single solution to the problems and their consequences. The solution to these problems springs from a multi-disciplinary approach. Such an approach means that all involved professions must work together as a team. To successfully help any child, you have to conceptualize the child as a puzzle: you need to collect the different pieces and put them together, thereby obtaining a complete understanding of the child. There are educational components, visual components, medical components, social and family components, and psychological components. When all of these parts are placed together (like the pieces of a puzzle), and each component is addressed in a satisfactory manner, what emerges is an enhanced understanding of the child. No one profession has all the answers, but all the professions working together as a team can effectively help the at-risk child.

The field of learning disabilities began as a result of this multidisciplinary approach towards a specific area of children's learning problems. A review of the literature in the field of learning disabilities shows that there was a relatively short period of time between the publication of the first textbook in 1947, and the passing of the first federal statute in the 1970's establishing criteria for identifying the learning-disabled child.[1-3] We can now see how an approach in which all involved professions, working together as a team, can obtain a result that benefits both the individual child and society as a whole.

As we address vision problems, at-risk children, poverty, learning problems, and social-emotional problems, we have to return to the puzzle analogy to put all the pieces together. All professions must add their unique contributions to solving the puzzle of the at-risk child. Most importantly, we can achieve solutions, which are based upon research and the practical application of research that will ameliorate these problems.

How do we accomplish this? To identify at-risk children, and to achieve practical solutions to their problems, we need to do more than attach labels to the children or the problems. Labels are important because they identify the problem areas, and they assist in the appropriation of funding. In addition, we need an "operational diagnosis" to understand the at-risk child. An operational diagnosis is not simply the identification of the problem; it also gives the underlying reason for the problem, which can then lead us to solutions.[4]

Prevalence Of Visual Problems

The prevalence of visual problems in our school children is significant.[5] According to the following national organizations, the problems have been identified in the following ways:

The National Parent Teacher Association reports that more that ten million children suffer from visual problems[6]

The Prevent Blindness America organization indicates that vision problems affect one in twenty preschoolers and one in four school age children[7]

By whatever measure is used, we now realize that the level of the problem is substantial, and the ripple effects have an enormous social and economic impact.

When estimating the monetary costs to society of undetected vision problems in children, we have to realize that these children grow up and become part of the total population. According to the Healthy People Twenty Ten Conference, "in 1981, the economic impact of visual disorders and disabilities was approximately $14.1 billion per year. By 1995 this figure was estimated to have risen to more than $38.4 billion."[8] Looking at just one state, the Kentucky Optometric Association has reported that 10% of all preschoolers (21,100) in Kentucky have vision deficiencies. "This figure increases in grades K-6 where 25% or one in four (140,000) of Kentucky's children have vision deficiencies. The prevalence of vision disorders is even higher in children at risk."[9]

Working Definitions

What do we mean when we talk about "undetected vision problems"? To begin with, it is important to understand "*vision*," and to make a distinction between and *vision* and *eyesight*. *Eyesight* is the ability to see objects clearly. "20-20 eyesight" simply means that, from a distance of twenty feet, a child can clearly see letters that are 3/8 of an inch high. However, children usually read books that they hold at a viewing distance of 13 to 16 inches from their eyes. Some view computer screens at a viewing distance of approximately 20-24 inches from their eyes. 20/20 eyesight, even with glasses for vision correction, is not good enough. Good vision goes beyond good eyesight. Keep in mind some of these important aspects of vision:

Eyesight
Eye health
Eye teaming (the ability of the eyes to work properly together)
Eye focusing (the ability of the eyes to focus and shift focus at near point and distance)
Eye motility (the ability of the eyes to move together across a page of print, to directly view an object, or move from one viewing area to another)
Understanding what the eye sees

The Role Of Vision In The Developmental Process

Vision is an important process in the growth, development and performance of children.[10] It is evident that much of what we learn occurs through the visual processing of information. Vision is a guiding mechanism in the child's daily level of performance, as well as in his overall growth and development.[11] Continuing in this context, when we talk about "vision" we refer to the ability of the visual system to guide the individual in specific areas. The first such area, or level, is the general (gross) motor abilities, which views the child's ability—using the large muscles of the body—to function in the world around him. It is vision that gives the child the guiding mechanism that enables him to manipulate himself in his immediate environment and in the world around him.

The next level of performance is the special movements area. This level involves eye-foot and eye-hand coordination, which further enhances the child's ability to perform in his or her environment. In understanding this area of special movement we have to think in terms of eye-hand coordination, which is such an important part of a child's ability to perform satisfactorily in the classroom and in the world around him.

There are two components of eye-hand coordination.[12] The first is the more general aspect, which is the child's ability to use the eyes and the hands together as a team when performing functions in the world around him. Put simply, this means that a child can catch a baseball, or pick up a pencil, or pick up a knife and fork and began to utilize it. A child can take a piece of paper from his notebook, place it in front of him, and begin to work on it. The child can reach across the dining room table and get a glass of water, or reach for the ketchup without knocking over the glass of milk in front of him. These are all examples of the child using vision as a guiding mechanism.

The second component of eye-hand coordination is visual motor integration, which is a significant part of the special movement level of performance. This is the ability of a child to transfer and reproduce cultural symbols from one plane onto another. Examples include the ability to copy information from the chalkboard (vertical plane) onto a piece of paper (horizontal plane), the ability to copy information from a reference text, the ability to know information stored in the cortical areas of the brain and to write it down on paper. This sophisticated form of eye-hand coordination is a significant and contributory aspect of the child's performance in the classroom. So far as is known at the present time, there is no gene that gives a child the ability to copy cultural symbols from one plane onto another plane. This is a learned visual motor task. We take it for granted that every child has the ability to learn and perform it. With some children this skill has to be trained and developed.

The third area of performance comprises the ability to acquire and process visual information. This includes the following ocular motor skills: teaming, tracking, and focusing. "Teaming" simply means that the eyes have the ability to work together. First, the brain receives an image from each eye, and then it successfully fuses the images together to produce one visual image. "Tracking" (motility) is the ability of the eyes to move properly across the page of print, or to follow an object, or to look directly at an object using just the eyes, without using one's finger or a pointer as an aid. Focusing is the ability of the eyes to obtain clarity of objects at distance and at nearpoint. It includes the ability to shift focus from the nearpoint of the desk to the farpoint of the chalkboard, for example, or to focus for extended periods of time at a computer screen.

The fourth area or level of performance is the auditory-speech-language complex and its relation to vision. This is significant because after there is visual recognition of an object there must be an appropriate language match or response to that visual stimulus. Previously learned auditory information must be matched with the visual stimulus so that appropriate verbal responses can be made. This enables the child to communicate with others. Included in the processing of auditory stimuli are both speech and language. Dysfunction at this level requires the expertise of all the relevant professions, working together and taking a multidisciplinary approach to the problems.

The fifth level or area of performance is that of visual perception and cognition. This area requires that a child receives visual information properly, and then is able to make the appropriate interpretation of this information. All aspects of the visual

process, including reception, and ultimately integration of the visual stimuli, have to be performed satisfactorily in order to achieve adequate visual perception and cognition. For example, a child receives the visual data, recognizes it and ultimately is able to communicate it to others.

These levels of performance guide the child in all daily activities. A dysfunction in one or more of these levels of performance means that the child may not be able to perform satisfactorily in the classroom environment, and in many activities in the home and the play environments. This is true irrespective of the child's living in a higher or lower economic situation, in a one or two-parent home, or in an urban or suburban location.

The Impact of Undetected Vision Related Learning Problems on School Age Children

It is not surprising that some of the initial research in the 1970's found that emotional problems existed in those children who had visual problems. "The question at that period was whether children who were experiencing learning and visual problems also had emotional problems involved in the overall picture."[13] Specifically, it was important to determine whether children who had undetected and untreated visual problems, and displayed difficulty in the school environment, were also prone to having more emotional problems than those who did not have visual problems. The research indicated that, indeed, this was the case. The research indicated that the human figure drawings of children with vision related learning problems were experiencing feelings such as a lack of direction, a sense of not belonging, an inadequate sense of self-assurance, feelings of insecurity, inadequacy and inferiority.[13]

Vision And Juvenile Delinquency

Consider the child who is having difficulty in school because of undetected vision related learning problems. Now he is experiencing the attendant emotional components as well. Although this might begin as a minor problem, if the child's vision problems remain undetected, they might lead to other types of emotional problems, which might be more significant. Research in the late 1960's and the 1970's with the juvenile courts, psychology, and optometry collaborating, indicated a significant number of children with learning disabilities were appearing in the juvenile court system.[14,15] A relationship was found to exist between juvenile delinquency, learning problems, and associated visual problems. An additional factor now had to be considered: the emotional problems that can be associated with undetected visual problems. As more research was conducted in the 1980's and the 1990's, a much clearer picture was developing, one that showed that a relationship existed between vision, learning disabilities, and juvenile delinquency. By the year 2000, it was accepted that a significant number of undetected visual problems could be found in the population of adjudicated juveniles.[16]

As we consider this issue of emotional problems leading to social problems and delinquency, we must again recognize that no single profession holds the key solution. When it comes to delinquency, we need appropriate counseling, court services, psychological services, educational and medical services, as well as basic optometric services.

One of the earlier studies relating learning disabilities to juvenile delinquency indicated that the use of a multidisciplinary approach to treatment had a positive effect on the rate of recidivism. Specifically, with this approach, the learning disabled juvenile delinquents were six times less likely to return to the court system. "The authors feel that it is time to take the question of juvenile delinquency beyond the correlation phase that has been dealt with long enough. There appears to be significant evidence that remediation incorporating various educational and academic programs, along with traditional means of dealing with delinquent youths, has greatly reduced recidivism and helped many learning disabled children. Although the delinquent child with a learning disability presents a formidable challenge, this challenge can be met with a multidisciplinary approach in diagnosis and remediation."[17]

Further research showed: "The results of the study indicate a decrease in emotional involvement after a visual training program. It appears that for children who are experiencing minor emotional difficulties associated with learning difficulties, forms of academic therapy and educational remediation, such as visual perceptual training, are very therapeutic in alleviating some of their minor stress."[18] We are seeing the efficacy of a team approach, but one that respects the area of expertise of each of the involved professions. As the authors noted: "This is not to indicate that visual training or academic therapy be a substitute for psychotherapy or any other psychiatric intervention for those children requiring psychiatric care. The results of this study seem to confirm some of the early workers in the field who felt that social-emotional problems resulted from a child's learning difficulties and that with proper remediation and intervention much of the social-emotional difficulty would subside."[18]

Vision and Illiteracy

It became evident in the late 1980's and the early 1990's that illiteracy was a significant problem in the United States. Functional illiteracy is the inability of an individual to use reading, speaking, writing and computational skills in everyday life. According to the United States Department of Education, one in five American adults is functionally illiterate.[19] This means "there are at least 20-30 million American adults who have major difficulties with basic reading, writing, calculating, solving problems, and/or communicating well enough to function effectively on the job and in everyday living."[20] So the children of twenty years ago whom we missed in the inner city—the children of twenty years ago who had frustrations in the classroom, the children of twenty years ago who had antisocial behavior and who dropped out of school—became a part of these statistics. A significant number of them were found in the adult illiterate population.

Research in the early 1990's showed a link between undetected vision problems and illiteracy. This is not to say that every illiterate adult has a vision problem; however, a significant number of them were failing vision screening tests being conducted throughout the country. In New York City, 66% of the illiterate adults, in one study, failed one or more parts of an optometric evaluation.[21] In Norfolk and Virginia Beach, Virginia, 74% of an illiterate adult population failed one or more parts of a visual screening program.[22] The illiterate adults failed not only tests measuring distant visual acuity, but they also failed a significant number of tests mea-

suring other visual skills. The largest number of failures in the New York City study was in the near acuity portion of the test. In the Norfolk-Virginia Beach study, a significant number failed the tracking and near acuity parts of the vision screening tests. This confirms what has been said for four decades: there is more to good vision than just seeing a standard eye chart clearly. This research has indicated that the children of yesterday who had these undetected visual problems, whether they were teaming, tracking, or focusing, grew up to become part of today's population of illiterate adults.

Recent Research

In 1996 it was determined that 700,000 students drop out of high school each year.[23] **"**Dropout rates for minorities are twice that of non-minority students. The vast majority of academically at risk students are from low social economic backgrounds and often display characteristics such as poor school attendance and antisocial behavior."[24] Although many efforts are made to address this problem, and despite the implementation of various programs, The Education Commission of the States estimates that 30% of our nation's youth fail to acquire sufficient education to obtain adequate employment.[25]

The concept of the at-risk student became significant in the 1990's. Evaluations of students indicated that significant numbers in an academic and behavioral at-risk population have undetected and untreated visual problems. One of the most significant findings of the research was an 85% failure rate on one or more sub tests on a comprehensive vision screening performed in elementary, middle, and high school populations. Once again, the tests performed were not just distance acuity tests; also included was a screening vehicle that evaluated the tracking abilities, the convergence abilities, and the focusing abilities of the eyes at near point, as well as the very important visual motor integration task. The authors concluded in this 1996 publication that, with at-risk populations, "it is essential that classroom teachers work closely with vision care professionals, community volunteers and organizations in order that each pupil receives a comprehensive visual screening and appropriate follow up care."[24]

Research done in 1999 indicated that 74% of a population of adjudicated adolescents failed at least one of the sub tests utilized to screen for vision problems. The authors stated: "Although adjudicated juveniles have received various psychological, educational, and vocational treatments, most of these treatments have had limited effectiveness. It is difficult for a treatment program, particularly an academic one, to be effective if the adolescent lacks adequate visual skills. Unless at-risk adolescents with visual impairments are properly diagnosed and treated, many offenders, such as those in the current study, may end up in the criminal justice system."[26]

Today there are many programs around the country that are designed to help at-risk children. Title I of the Federal Elementary and Secondary Education Act allocates money to local school districts in order to improve the basic literary skills of children from low-income families. Title I was the first major federal aid program designed specifically for children in low-income areas. A vision screening research project found that 85% of the Title I students who were evaluated failed at least one sub test of the comprehensive vision screening battery. Specifically, the Title I students had a much higher failure rate on tracking, visual acuity at near, visual acuity at far, fusion, convergence, visual motor integration, and color vision sub test. "It is only thought such mutual cooperation that compromised vision can be ruled out as a contributing factor in student learning difficulties. Without such cooperation, academically at risk students such as those enrolled in Title I reading programs may become the school dropouts, juvenile offenders, and/or the illiterate adults of tomorrow."[27]

Conclusions

Toward the common goal of solving those problems found to be involved in children's vision and its relationship to learning problems, delinquency, illiteracy, and social and emotional problems, a multidisciplinary approach from all related professions is recommended. Vision should be considered an academic tool for children. I recommend the following, based on research cited above:

1. Prior to entering kindergarten, or by age five, every child should have a comprehensive vision examination performed by an eye care professional.
2. Each year thereafter, it is recommended that every child should have an annual vision examination from K-12th grade.
3. If it is not feasible to provide annual vision examinations to every child, then a comprehensive vision examination should alternate with a vision screening every other year, through 12th grade.
4. The vision screening program should thoroughly investigate visual abilities at the near point, as well as vision abilities for distant viewing.
5. The appropriate grades for vision screenings start with the first grade, followed by the third, fifth, seventh, ninth, and eleventh grades.

Children should not be sent to school without having *all* the proper tools—good vision, paper, pencils, and books.

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